years.[68/] Moreover, the majority of facilities in these bands, as in the Commercial 2 GHz Band, are fixed point-to-point microwave systems.[69/] Recognizing the similarity between the bands' users, the House Committee on Energy and Commerce has explicitly advocated use of this band by both federal and commercial microwave users. The Committee found:

> Maintaining separate blocks of frequencies for fixed microwave services constitutes an inefficient approach to spectrum management. That inefficiency is particularly egregious in this instance, inasmuch as it is relatively easy to engineer fixed microwave networks - of both federal and nonfederal users - so as to avoid harmful interference.

House Report, supra, note 32, at 16.

In light of this information, the Commission should fully investigate use of this band for relocating displaced users of the Commercial 2 GHz Band. At least some railroads have preliminarily concluded that if they have to move their existing 2 GHz operations, they would prefer to move to the 1710-1850 MHz band rather than to the bands proposed by the Commission. This move likely would be less costly and would require fewer

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68/ See Petition to Suspend at 5-7.

69/ According to the NTIA Report, 4,847 of the unclassified installations in the 1710-1850 MHz Band are fixed microwave facilities, as are 308 of the unclassified installations at 2200-2290 MHz, for a total of 5,155 fixed microwave installations. These facilities are used for the same purposes as their counterparts in the Commercial 2 GHz Band -- high speed relaying, supervisory control, load control, telemetering, data acquisition, land-mobile radio dispatching, operations and maintenance. NTIA Report at 4-1, Table 5-1 (page 2), and Table 6-1 (page 4). See also OET Report at Table 1.

alterations to their existing systems.[70/] Accordingly, the potential impairment of safe and reliable operations would be reduced, and the Commission's stated objective of minimizing impact on displaced licensees would be served.

70/ See Attachments B and C, which show that existing fixed microwave equipment can operate in both the federal and Commercial 2 GHz Band, i.e., from 1700 to 2300 MHz.

VI. CONCLUSION

The Commission should not reallocate any spectrum for emerging technologies such as PCS until it meets its burden of demonstrating that such reallocation serves the public interest. To do so, the Commission must resolve the many uncertainties about PCS and about how its proposed reallocation scheme actually will work. The railroads and other vital industries must be guaranteed that the safety and reliability of their operations will not be impaired and that they will not bear the cost of relocation from the 2 GHz band.

Respectfully submitted,

THE ASSOCIATION OF AMERICAN RAILROADS

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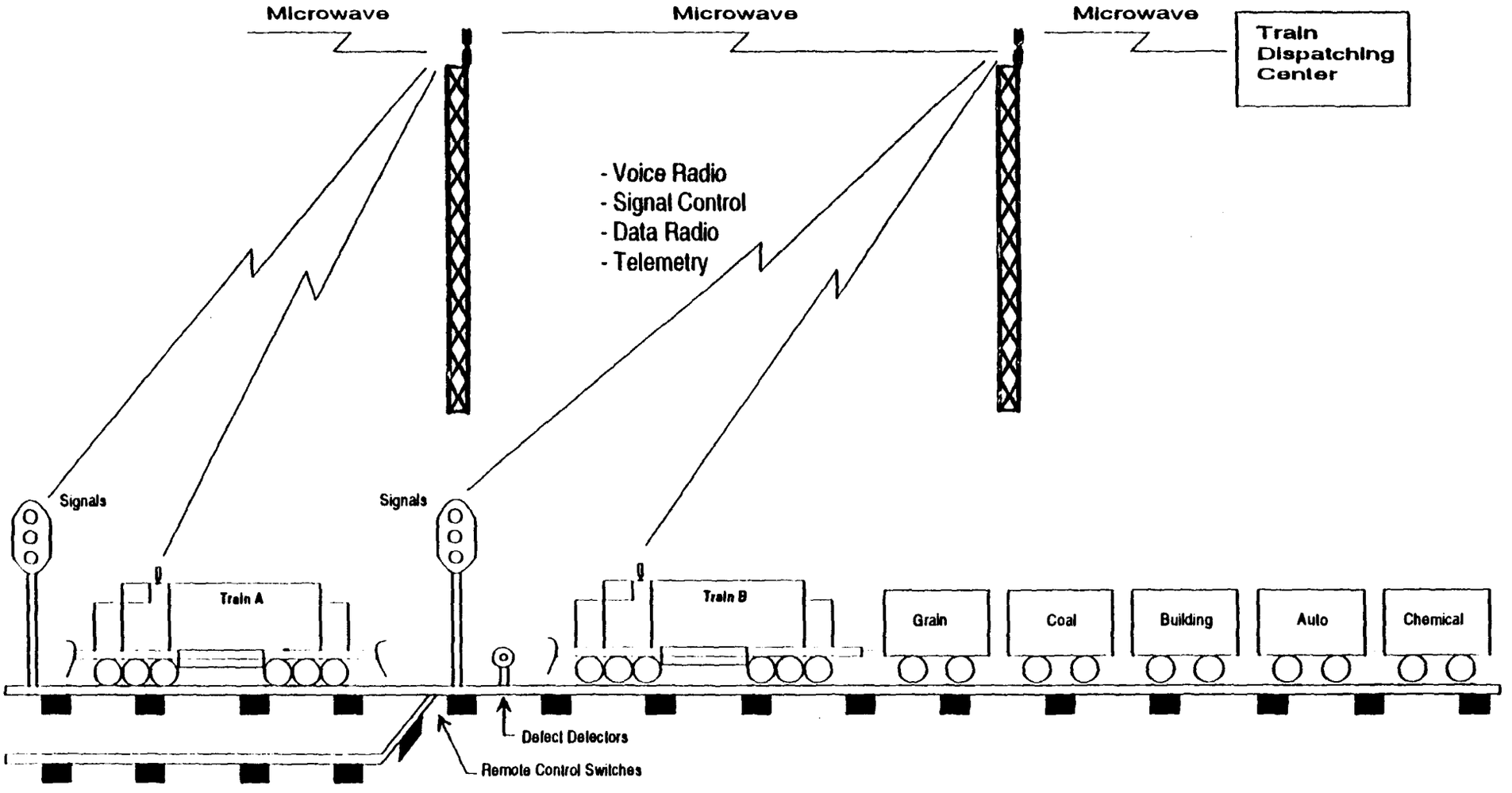
June 8, 1992

Railroad Microwave Radio Systems

- are essential for safe, reliable, efficient rail transportation to interconnect train control systems.



Public safety is dependent on safe transportation.

Railroad freight transportation is critical to U.S. economy.

Attachment A

F A R I N O N

A FULL SPECTRUM OF PRODUCTS & SERVICES

FAS-2000 "e Series"
2 GHz Analog Radio

SPECIFICATIONS

SYSTEM CHARACTERISTICS

Frequency	
Range	1,700 to 2,300 MHz
Plans	
U.S. Operational Fixed FCC Part	94
U.S. Common Carrier FCC Part	21
CCIR Rec. 283-4	
T-R Spacing	49 MHz, minimum
T-T Or R-R Spacing	
Single Polarized Antenna	28 MHz, minimum
Dual Polarized Antenna	14 MHz, minimum
CCIR Rec. 382-3	
T-R Spacing	68 MHz, minimum
T-T Or R-R Spacing	
Single Polarized Antenna	58 MHz, minimum
Dual Polarized Antenna	29 MHz, minimum
Canada DOC SRSP 303, 301.9 Issue 2	
Emphasis	CCIR Rec. 275-3 Or Flat
Altitude	4,572 m/15,000 feet AMSL
Humidity	95% at +40°C
Temperature Range	
Full Performance	0° to +50°C
Operation	−30° to +55°C
Storage	−40° to +65°C

BASEBAND CHARACTERISTICS
(Excluding BB Treatment Components)

Test Tone Levels & Impedance	
Transmitter Input Levels	
Baseband (3 Ports, 75 ohms, Unbalanced)	
Main Port (Switch Selectable)	−25, −35, or −45 dBm
Aux Port 1	−25 dBm
Aux Port 2	−25 dBm
O.W./Alarm	
(2 Port, 600 ohms, Balanced)	−20 dBm
or	
(1 Port, 75 ohms, Unbalanced)	−20 or −25 dBm
Receiver Output Levels	
Baseband (3 Ports, 75 ohms, Unbalanced)	
Main Port (Switch Selectable)	−15 or −25 dBm
Aux Port 1	−25 dBm
Aux Port 2	−25 dBm
O.W./Alarm	
(2 Port, 600 ohms, Balanced)	0 dBm
or	
(1 Port, 75 ohms, Unbalanced)	0 or −25 dBm
Return Loss	
0.3 kHz To Top BB Frequency	26 dB
Frequency Responses	
0.3 To 0.5 kHz	+0 to −1.0 dB
0.5 To 12 kHz	±0.5 dB
12 kHz To Top BB Frequency	±0.25 dB
Spurious Tones	
12 kHz To Top BB Frequency	−70 dBm0, maximum
When 600 ohms O.W. Equipped	
12 To 30 kHz	−60 dBm0, maximum
30 kHz To Top BB Frequency	−70 dBm0, maximum
Isolation Between Main & Aux Baseband Ports	
4 kHz To Top BB Frequency	70 dB, minimum

Specifications

	MDR-5102	MDR-5202	MDR-5302
Frequency band (GHz)	1.7-2.3	1.7-2.3	1.7-2.3
Emission designator	3M50D7W	3M20D7W	1M60D7W
RF channel bandwidth (MHz)	3.5	3.2	1.6
Capacity/RF channel (DS1s)	12	8	4
Modulation (QAM)	256	64	64
Data rate (Mb/s)	18.528	12.352	6.176
Data efficiency (b/s per Hz)	5.29	3.86	3.86
FCC identifier	JF6-8804	JF6-8903	JF6-8904
FCC internal identifier	27RA-01	27J7-01	27JF-01
System gain (BER = 10^{-3})[1]			
Without APC (dB)	102.5	112	115
With APC (dB)	104.5	113	116
Transmit frequency stability	0.001%	0.001%	0.001%
Transmitter power output			
Maximum transmit power (with APC) (dBm)	30	31	31
Maximum transmit power (without APC) (dBm)	28	30	30
Nominal transmit power (with APC) (dBm)	17	18	18
Receiver threshold (BER = 10^{-3})[1]			
Guaranteed (dBm)	–71.5	–80.0	–83.0
Typical (dBm)	–74.5	–82.0	–85.0
Receiver threshold (BER = 10^{-6})[1]			
Guaranteed (dBm)	–70.0	–78.5	–81.5
Typical (dBm)	–72.5	–80.0	–83.0
Maximum RSL for 10^{-3} BER (dBm)	–20	–17	–17
Dispersive fade margin (BER = 10^{-6}) (dB)	51	56	72
Threshold/Interference			
Cochannel (dB)	38.8	33	33
Adjacent channel (dB)	–10	–10	–10

Power Requirements

Input Voltage	–21 to –28 or –42 to –56 V dc
Typical Power Consumption Per T/R	112 watts
With APC	94 watts

Mechanical Dimensions and Interfaces

Size (H x W x D)	40.25 x 19.0 x 13.0 in
Weight	85 pounds
RF In/Out	Type-N female
DS1 In/Out	Two 36-pin Amp-Champ (one xmtr, one rcvr) or wire wrap
Orderwire Handset	Standard telephone handset jack
Service Channel	BNC 75Ω female

Excerpt from Alcatel Network Systems Product Brochure:
"Multipurpose 2-GHz Radio; Collins MDR-5X02"

CERTIFICATE OF SERVICE

I, Jaime Y.W. Bierds, a secretary for the law firm Verner, Liipfert, Bernhard, McPherson and Hand, Chartered, do hereby certify that a true and correct copy of the foregoing "Comments of Association of American Railroads" was mailed first-class, postage prepaid, this 8th day of June, 1992, to the following:

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